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CLAIMS

What is claimed is:

1.   A method of identifying a pathogen comprising the steps of:

    a)   isolating mRNA from one or more dendritic cells; and

5   b)   determining gene expression of at least one stimulus-specific gene, wherein expression of a stimulus-specific gene is indicative of infection by a pathogen to which the stimulus-specific gene is specific.

2.   The method of Claim 1, wherein stimulus-specific gene expression is increased.

10 3.   The method of Claim 1, wherein stimulus-specific gene expression is decreased.

4.   The method of Claim 1, wherein stimulus-specific gene is not expressed.

5.   A method of identifying a pathogen comprising the steps of:

    a)   contacting immature dendritic cells with a pathogen or immunogenic components thereof;

15 b)   isolating and labeling mRNA from said dendritic cells;

    c)   detecting labeled mRNA from said dendritic cells such that a gene profile is produced; and

    d)   analyzing the gene profile relative to one or more reference gene profile(s) such that at least one stimulus-specific gene is identified

20   thereby identifying a pathogen for which the stimulus-specific gene is specific.

6.   A method of diagnosing infection in a mammal comprising the steps of:

    b)   isolating mRNA from one or more dendritic cells in a mammal;

    b)   contacting said mRNA with at least one stimulus-responsive gene probe wherein hybridization of a stimulus-responsive probe to said mRNA is indicative of infection in said mammal.

7.   The method of Claim 6, wherein the stimulus-responsive probe is stimulus-specific probe.

8.   The method of Claim 6, wherein the stimulus-responsive probe is a common-stimulus-responsive probe.

9.   A method of diagnosing infection by a pathogen in a mammal comprising the steps of;

    a)   isolating mRNA from one or more dendritic cells in a mammal;

    b)   determining gene expression of at least one-stimulus-specific gene wherein expression of a stimulus-specific gene is indicative of infection by a pathogen to which the stimulus-specific gene is specific.

10.   The method of Claim 9, wherein stimulus-specific gene expression is increased.

11.   The method of Claim 9, wherein stimulus-specific gene expression is decreased.

12.   A method for predicting prognosis for an infected individual comprising the steps of:

    a)   analyzing gene profiles of stimulus-responsive genes, wherein a gene profile is correlated with a clinical prognosis.

13.   The method of Claim 12, wherein the stimulus-responsive genes are stimulus-specific.

14. The method of Claim 12, wherein the stimulus-responsive genes are common stimulus-responsive genes.

15. A method of formulating a therapeutic regimen comprising the steps of:
    a) identifying the pathogen; and
    b) formulating the therapeutic regimen accordingly.

16. The method of Claim 15, comprising a further step of repeated assessment of patient for a pathogen and formulating a therapeutic regimen.

17. A method of optimizing a vaccine comprising the steps of:
    a) contacting one or more immature dendritic cells with test vaccines;
    b) isolating mRNA from said dendritic cells;
    c) determining gene profiles in said dendritic cells; and
    d) selecting a test vaccine which elicits a gene profile indicative of an optimized vaccine.

18. An *ex vivo* therapeutic treatment for a pathogen comprising the steps of:
    a) contacting a patient's dendritic cells with a pathogen or components thereof such that said dendritic cells become activated;
    b) returning activated dendritic cells to the patient such that activated dendritic cells trigger an immune response against said pathogen.

19. An *ex vivo* therapeutic treatment for a tumor comprising the steps of:
    a) contacting a patient's dendritic cells with tumor cells or components thereof such that said dendritic cells become activated;
    b) returning activated dendritic cells to the patient such that activated dendritic cells trigger an immune response against said tumor cells or components thereof.

20. An *ex vivo* therapeutic treatment for autoimmunity comprising the steps of:
    a) contacting a patient's dendritic cells with self-antigens or components thereof such that said dendritic cells become activated;
    c) returning activated dendritic cells to the patient such that activated dendritic cells do not trigger an immune response against said self-antigens.

21. An *ex vivo* therapeutic treatment for graft-rejection comprising the steps of:
    a) contacting a patient's dendritic cells with graft-tissue or components thereof such that said dendritic cells become activated;
    b) returning activated dendritic cells to the patient such that activated dendritic cells do not trigger an immune response against graft-tissue.

22. A method of measuring the immune response to a stimulus comprising the steps of:
    a) contacting one or more dendritic cells with a stimulus;
    b) isolating mRNA from said dendritic cells; and
    c) determining a gene profile such that at least one stimulus-responsive gene is identified which is indicative of an immune response.

23. A method of measuring the immune response to a stimulus comprising the steps of:
    a) contacting dendritic cells with a stimulus;
    b) isolating and labeling mRNA from said dendritic cells;
    c) contacting a DNA microarray with labeled mRNA from said dendritic cells; and
    d) measuring and analyzing the gene profile relative to control stimulus such that at least one stimulus-responsive gene is identified which is indicative of an immune response.

24.   The method of Claim 23, wherein dendritic cells are obtained from peripheral blood.

25.   The method of Claim 23, wherein the stimulus is selected from the group consisting of bacteria, fungi, viruses, or components thereof.

5   26.   The method of Claim 23, wherein the stimulus is selected from the group consisting of *Escherichia coli, Staphylococcus aurens*, influenza *virus, Candida albicans,* lipopolysaccharide (LPS), polyI:C, and yeast mannan.

27.   The method of Claim 23, wherein the stimulus is selected from the group consisting of physical, chemical, or electrical.

10   28.   The method of Claim 23, wherein the stimulus is selected from the group consisting of inorganic chemicals and organic chemicals.

29.   The method of Claim 23, wherein the stimulus comprises a combination selected from the group consisting of: inorganic chemicals and organic chemicals.

30.   The method of Claim 23, wherein the DNA microarray is Affymetrix HU 6800.

15   31.   The method of Claim 23, wherein the stimulus-responsive gene's expression is increased in response to the stimulus.

32.   The method of Claim 23, wherein the stimulus-responsive gene's expression is decreased in response to the stimulus.

33.   The method of Claim 23, wherein the stimulus-responsive gene is stimulus-
20   specific.

34.	A method of measuring the gene profile in dendritic cells in response to a stimulus comprising the steps of:

a)	contacting immature dendritic cells with a stimulus;

b)	isolating and labeling mRNA from said dendritic cells;

5	c)	contacting a DNA microarray with labeled mRNA from said dendritic cells; and

d)	measuring and analyzing the gene profile relative to control stimulus such that at least one stimulus-responsive gene is identified.

35.	The method of Claim34, wherein dendritic cells are obtained from peripheral

10	blood.

36.	The method of Claim 34, wherein the stimulus is selected from the group consisting of bacteria, fungi, viruses, or components thereof.

37.	The method of Claim 34, wherein the stimulus is selected from the group consisting of *Escherichia coli, Staphylococcus aurens*, influenza virus, *Candida*

15	*albicans,* lipopolysaccharide (LPS), polyI:C, and yeast mannan.

38.	The method of Claim 34, wherein the stimulus is selected from the group consisting of physical, chemical, or electrical.

39.	The method of Claim 34, wherein the stimulus is selected from the group consisting of inorganic chemicals and organic chemicals.

20	40.	The method of Claim 34, wherein the stimulus comprises a combination selected from the group consisting of: inorganic chemicals and organic chemicals.

41. The method of Claim 34, wherein the DNA microarray is Affymetrix HU 6800.

42. The method of Claim 34, wherein the stimulus-responsive gene's expression is increased in response to the stimulus.

43. The method of Claim 34, wherein the stimulus-responsive gene's expression is decreased in response to the stimulus.

44. The method of Claim 34, wherein the stimulus-responsive gene is stimulus-specific.

45. A method for generating a database of stimulus-responsive genes comprising the steps of:

a) contacting immature dendritic cells with a stimulus;

b) isolating and labeling mRNA from said dendritic cells;

c) contacting a DNA microarray with labeled mRNA from said dendritic cells; and

d) measuring and analyzing the gene profile relative to control stimulus such that a database containing at least one stimulus-responsive gene is generated.

46. A method of generating a database of stimulus-specific genes comprising the steps of:

a) contacting immature dendritic cells with a stimulus;

b) isolating and labeling mRNA from said dendritic cells;

c) contacting a DNA microarray with labeled mRNA from said dendritic cells; and

d) measuring and analyzing the gene profile relative to control stimulus such that a database of stimulus-specific genes containing at least one stimulus-specific gene is generated.

47. A method of generating a database of common stimulus-responsive genes comprising the steps of:

   a) contacting dendritic cells with a stimulus;

   b) isolating and labeling mRNA from said dendritic cells;

   c) contacting a DNA microarray with labeled mRNA from said dendritic cells; and

   d) measuring and analyzing the gene profile relative to control stimulus such that a database of common stimulus-responsive genes containing at least one common stimulus-responsive gene is generated

48. A database of stimulus-responsive genes.

49. A database of stimulus-specific genes.

50. A database of common stimulus-responsive genes.

51. A method of identifying a pathogen comprising the steps of:

   a) contacting one or more immature dendritic cells with a stimulus;

   b) isolating mRNA from said dendritic cells; and

   c) determining a gene profile such that at least one stimulus-specific gene is identified thereby identifying a pathogen for which the stimulus-specific gene is specific.

52. A method of identifying a pathogen comprising the steps of:

   a) contacting one or more immature dendritic cells with a stimulus;

b)   isolating and labeling mRNA from said dendritic cells;

c)   contacting a DNA microarray with labeled mRNA from said dendritic cells; and

d)   measuring and analyzing the gene profile relative to control stimulus such that at least one stimulus-specific gene is identified thereby identifying a pathogen for which the stimulus-specific gene is specific.

53.   A method of diagnosing infection by a pathogen comprising the steps of:

a)   isolating mRNA from dendritic cells; and

b)   determining a gene profile such that at least one stimulus-specific gene is identified thereby identifying a pathogen for which the stimulus-specific gene is specific which is indicative of infection.

54.   A method of diagnosing infection by a pathogen comprising the steps of:

a)   isolating and labeling mRNA from dendritic cells;

b)   contacting a DNA microarray with labeled mRNA from said dendritic cells; and

c)   measuring and analyzing the gene profile relative to control stimulus such that at least one stimulus-specific gene is identified thereby identifying a pathogen for which the stimulus-specific gene is specific which is indicative of infection.

55.   A method of diagnosing infection in a mammal comprising the steps of:

a) isolating proteins from one or more dendritic cells from said mammal;

b) contacting said proteins with at least one stimulus-specific antibody; wherein binding of a stimulus-specific antibody to said proteins are indicative of infection in said mammal.

56.   A gene profile comprising *E. coli*-specific genes.

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57.   A gene profile comprising *Candida albican*-specific genes.

58.   A gene profile comprising influenza virus-specific genes.